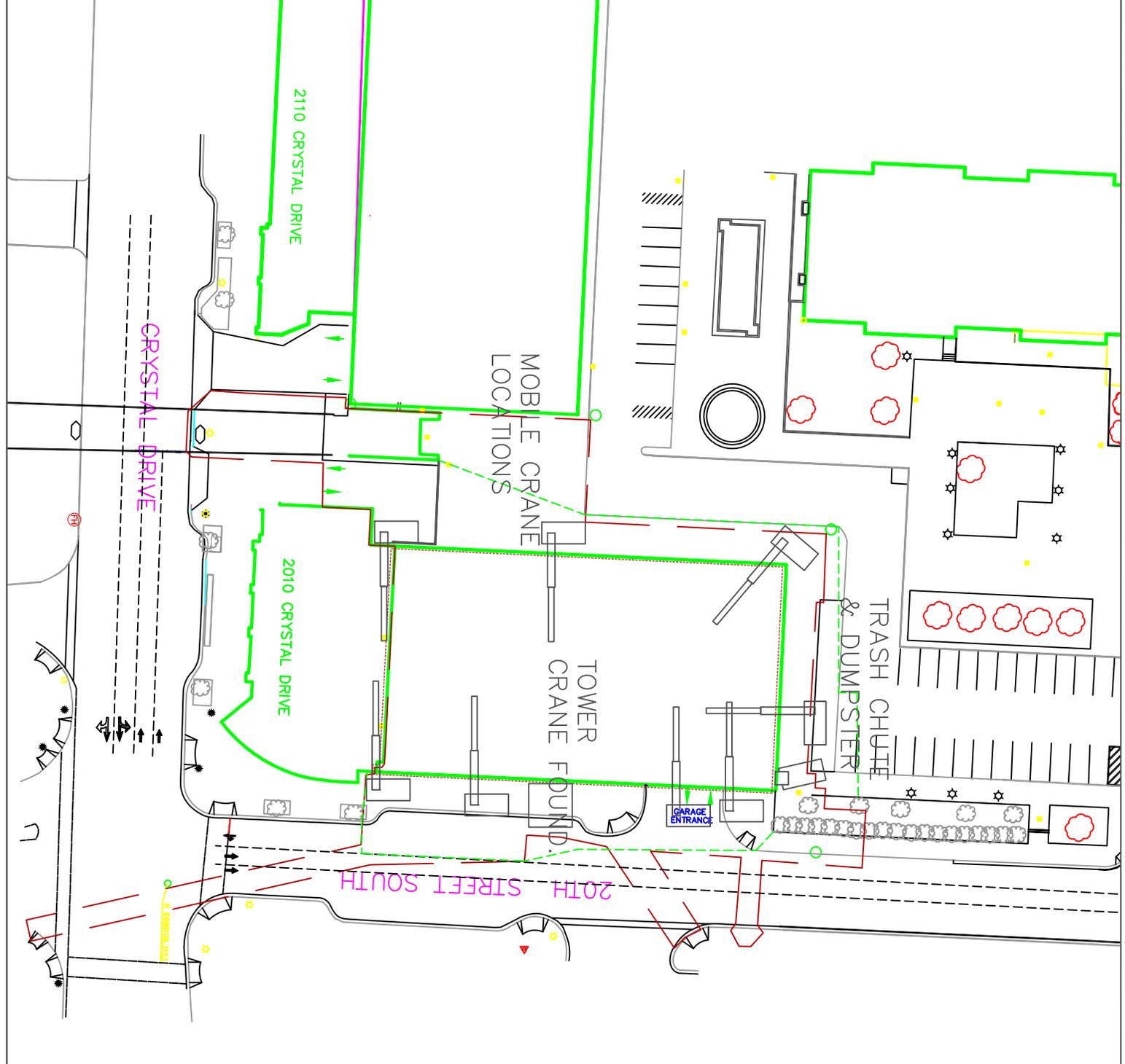




Christopher R. Stultz | Construction Management
Dr. David Riley | Advisor

Appendix A User Created Documents



- - - - - SITE FENCE
- - - - - CONSTRUCTION DISTURBANCE LIMIT

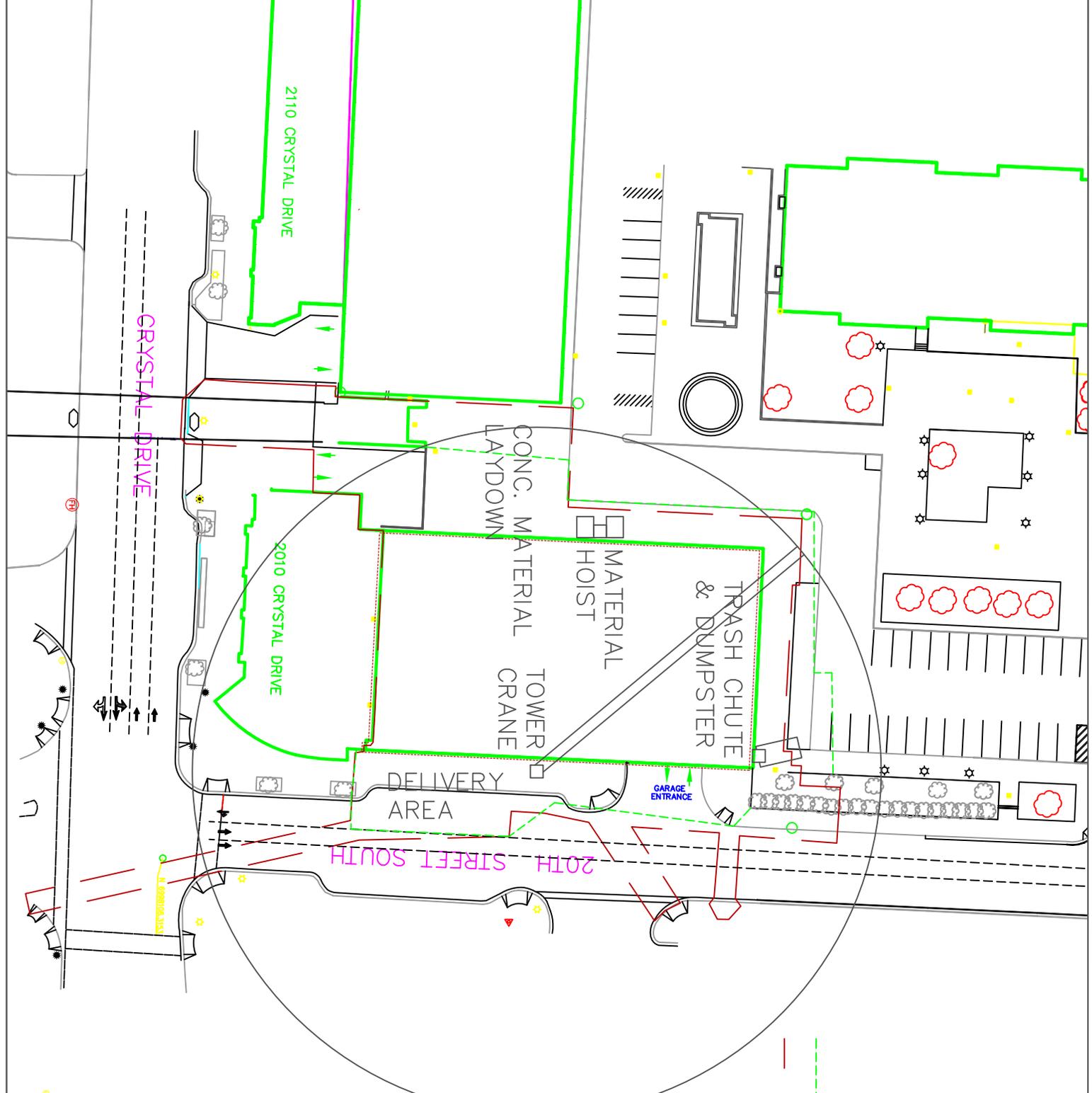


ARLINGTON, VIRGINIA

CRYSTAL CITY DEMO PHASE

SCALE 1/64"=1'

SUBMITTED DATE: CHRISTOPHER R. STULTZ
 OCT 23, 2008 SHEET 1 OF 1



- - - - - SITE FENCE
 - - - - - CONSTRUCTION DISTURBANCE LIMIT



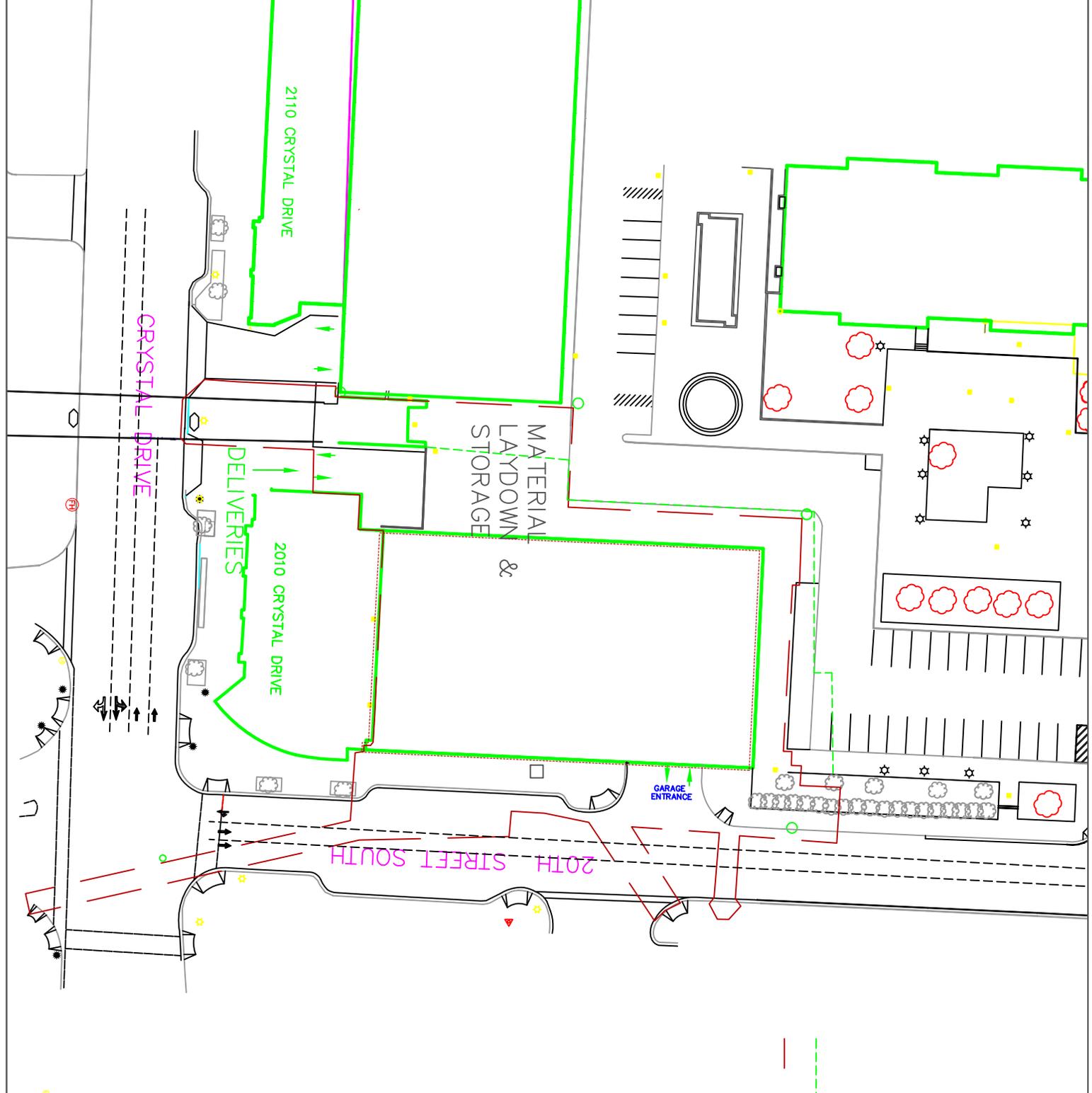
ARLINGTON, VIRGINIA

CRYSTAL CITY GENERAL COND.

SCALE 1/64"=1'

SUBMITTED DATE: CHRISTOPHER R. STULTZ

OCT 23, 2008 SHEET 1 OF 1



- SITE FENCE
- CONSTRUCTION DISTURBANCE LIMIT



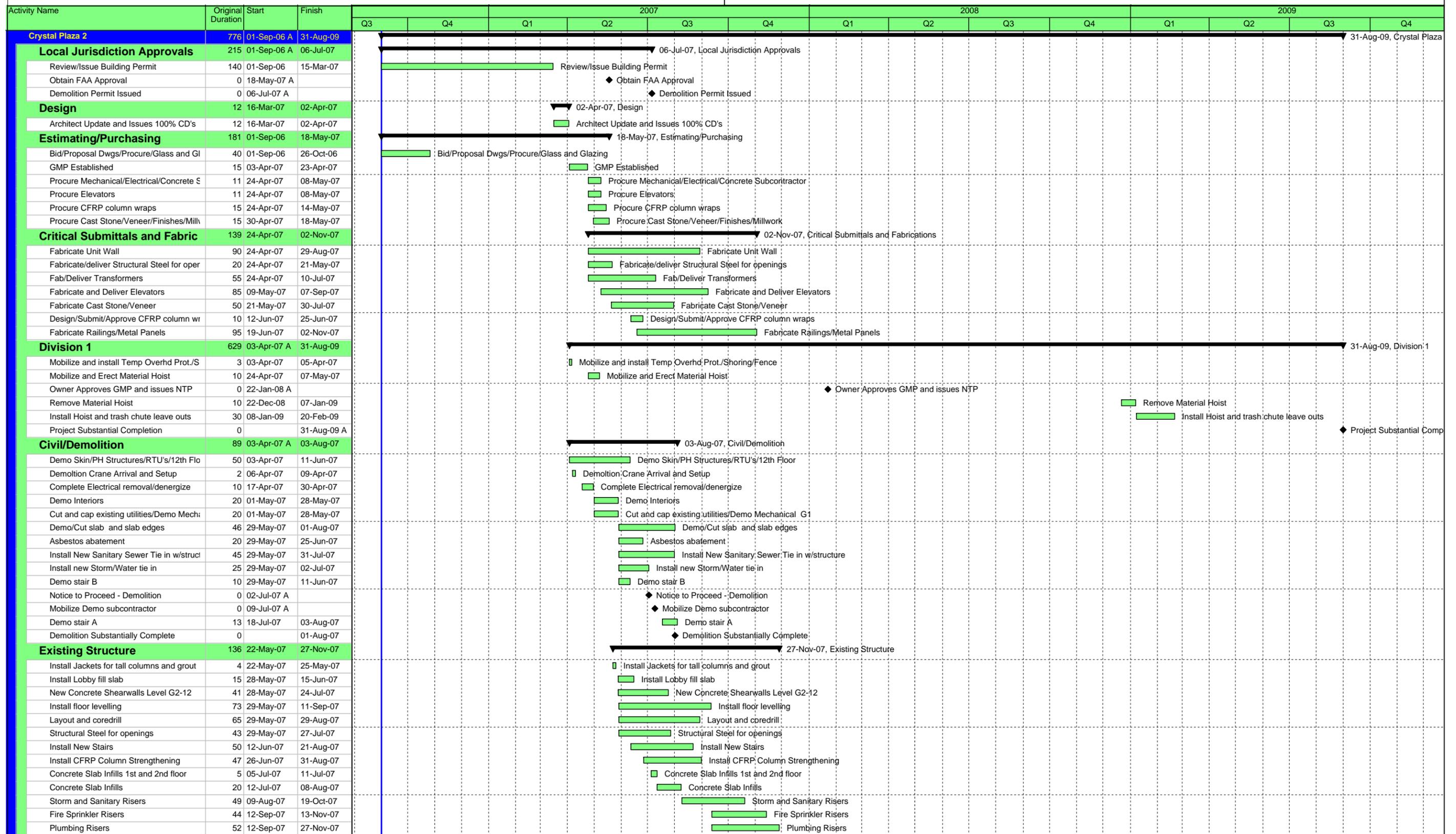
ARLINGTON, VIRGINIA

CRYSTAL CITY FINISH PHASE

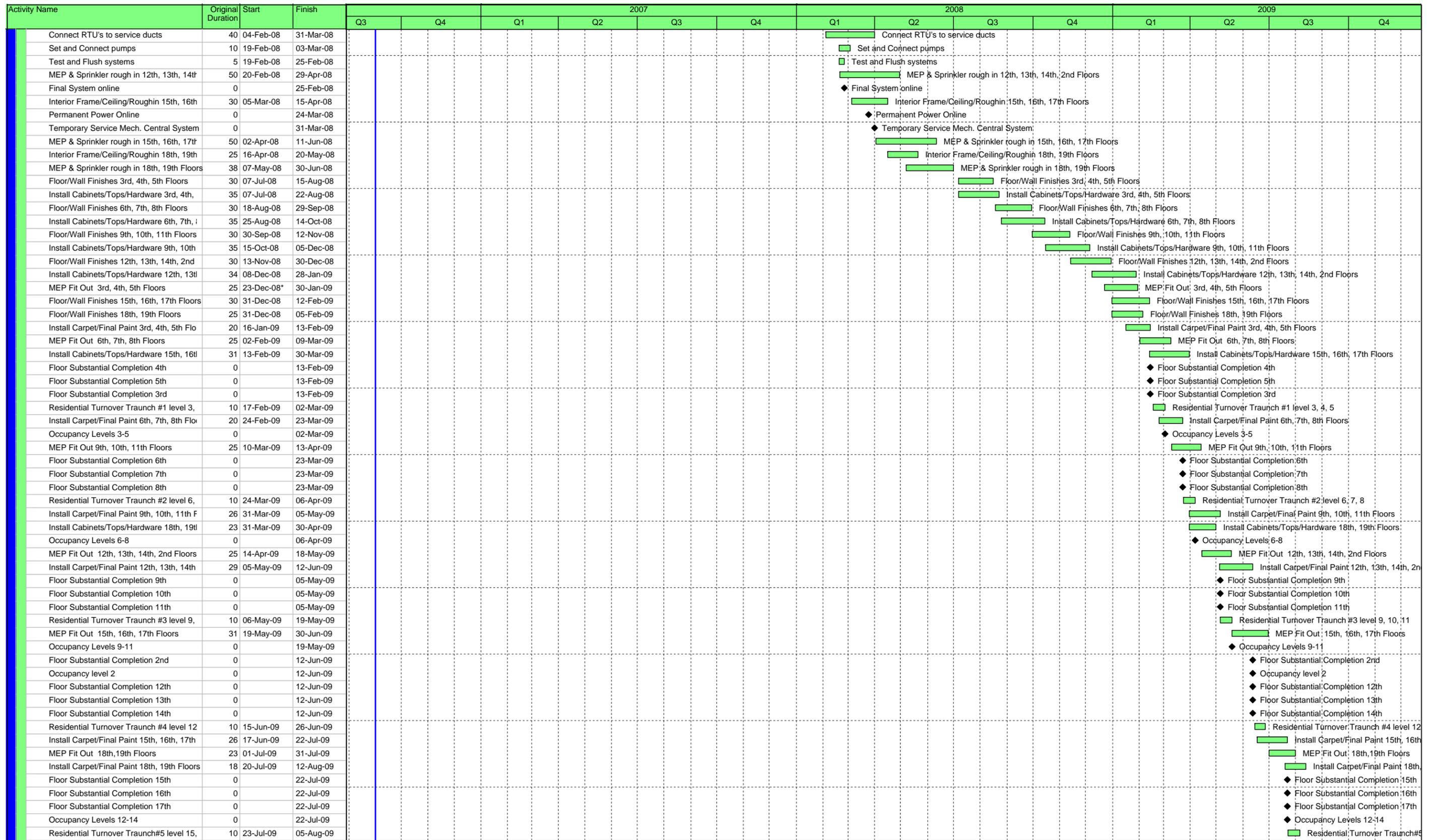
SCALE 1/64"=1'

SUBMITTED DATE: CHRISTOPHER R. STULTZ

OCT 23, 2008 SHEET 1 OF 1



█ Actual Work
 █ Critical Remaining Work
 Summary
 █ Remaining Work
 ◆ Milestone



█ Actual Work
 █ Critical Remaining Work
 ▼ Summary
█ Remaining Work
 ◆ Milestone

South Façade													
	Sun Hours(kWh/m2/day)												Yr Avg or Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	3.4	3.7	3.5	3.1	2.6	2.5	2.6	2.9	3.3	3.7	3.3	3	3.13
days	31	28	31	30	31	30	31	31	30	31	30	31	365
kWh/mon	8182.97	8,043.23	8,423.65	7,220.27	6,257.57	5,822.80	6,257.57	6,979.60	7,686.09	8,905.00	7,686.09	7,220.27	7,390.43
Monthly kWh	675,818.35	610,416.58	675,818.35	654,017.76	675,818.35	654,017.76	675,818.35	675,818.35	654,017.76	675,818.35	654,017.76	675,818.35	7,957,216.08
Monthly kWh after Solar	667,635.38	602,373.35	667,394.70	646,797.49	669,560.78	648,194.96	669,560.78	668,838.76	646,331.67	666,913.35	646,331.67	668,598.08	7,868,530.97
Monthly Bill w/o solar	\$32,052.02	\$29,131.83	\$32,052.02	\$31,078.62	\$32,052.02	\$49,669.20	\$51,263.04	\$51,263.04	\$49,669.20	\$32,052.02	\$31,078.62	\$32,052.02	\$453,413.63
Bill/unit	\$120.50	\$109.52	\$120.50	\$116.84	\$120.50	\$186.73	\$192.72	\$192.72	\$186.73	\$120.50	\$116.84	\$120.50	\$142.05
Monthly Bill w/solar	\$31,686.65	\$28,772.70	\$31,675.90	\$30,756.24	\$31,772.62	\$49,243.49	\$50,805.55	\$50,752.76	\$49,107.27	\$31,654.41	\$30,735.44	\$31,729.63	\$448,692.65
Bill/unit	\$119.12	\$108.17	\$119.08	\$115.62	\$119.45	\$185.13	\$191.00	\$190.80	\$184.61	\$119.00	\$115.55	\$119.28	Total
Savings	\$365.37	\$359.13	\$376.12	\$322.39	\$279.40	\$425.70	\$457.49	\$510.28	\$561.93	\$397.61	\$343.18	\$322.39	\$4,720.98

Watts/SF	Size kW	Total kWh	Efficiency of Grid Connected System	kWh/Year	120/240 System Max Demand (kW)	Use Factor	120/240 Adjusted Demand (kW)	Daily kWh usage 120/240	Cost/kW Installed	Cost of System	Estimated simple payback using savings
5	89	88685.11	0.90	79,816.60	1513.93	0.6	908.36	21,800.59	\$8,500.00	\$757,286.69	160.41

South, East, and West Facades													
	Sun Hours(kWh/m2/day)												Yr Avg or Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
South	3.4	3.7	3.5	3.1	2.6	2.5	2.6	2.9	3.3	3.7	3.3	3	3.13
days	31	28	31	30	31	30	31	31	30	31	30	31	365
kWh/mon	8,182.97	8,043.23	8,423.65	7,220.27	6,257.57	5,822.80	6,257.57	6,979.60	7,686.09	8,905.00	7,686.09	7,220.27	7,390.43
East	3.4	3.7	3.5	3.1	2.6	2.5	2.6	2.9	3.3	3.7	3.3	3	3.13
days	31	28	31	30	31	30	31	31	30	31	30	31	365
kWh/mon	3,628.46	3,566.50	3,735.18	3,201.59	2,774.71	2,581.92	2,774.71	3,094.87	3,408.14	3,948.62	3,408.14	3,201.59	39,371.46
West	3.4	3.7	3.5	3.1	2.6	2.5	2.6	2.9	3.3	3.7	3.3	3	3.13
days	31	28	31	30	31	30	31	31	30	31	30	31	365
kWh/mon	3,628.46	3,566.50	3,735.18	3,201.59	2,774.71	2,581.92	2,774.71	3,094.87	3,408.14	3,948.62	3,408.14	3,201.59	39,371.46
Monthly kWh after Solar	660,378.45	595,240.36	659,924.34	640,394.32	664,011.37	643,031.11	664,011.37	662,649.03	639,515.39	659,016.11	639,515.39	662,194.91	7,789,882.14
Monthly Bill w/o solar	\$32,052.02	\$29,131.83	\$32,052.02	\$31,078.62	\$32,052.02	\$49,669.20	\$51,263.04	\$51,263.04	\$49,669.20	\$32,052.02	\$31,078.62	\$32,052.02	\$453,413.63
Bill/unit	\$120.50	\$109.52	\$120.50	\$116.84	\$120.50	\$186.73	\$192.72	\$192.72	\$186.73	\$120.50	\$116.84	\$120.50	\$142.05
Monthly Bill w/solar	\$31,362.63	\$28,454.21	\$31,342.35	\$30,470.33	\$31,524.84	\$48,865.96	\$50,399.83	\$50,300.23	\$48,608.93	\$31,301.80	\$30,431.09	\$31,443.73	\$444,505.93
Bill/unit	\$117.90	\$106.97	\$117.83	\$114.55	\$118.51	\$183.71	\$189.47	\$189.10	\$182.74	\$117.68	\$114.40	\$118.21	Total
Savings	\$689.39	\$677.62	\$709.67	\$608.29	\$527.18	\$803.23	\$863.21	\$962.81	\$1,060.27	\$750.22	\$647.53	\$608.29	\$8,907.70

Watts/SF	Size kW	Total kWh	Efficiency of Grid Connected System	kWh/Year	120/240 System Max Demand (kW)	Use Factor	120/240 Adjusted Demand (kW)	Daily kWh usage 120/240	Cost/kW Installed	Cost of System	Estimated simple payback using savings
5	89	88685.11	0.90	79,816.60	1513.93	0.6	908.36	21,800.59	\$8,500.00	\$757,286.69	
5	50	39324.42	0.90	35,391.97	1513.93	0.6	908.36	21,800.59	\$8,500.00	\$424,493.28	
5	50	39324.42	0.90	35,391.97	1513.93	0.6	908.36	21,800.59	\$8,500.00	\$424,493.28	
									Total	\$1,606,273.24	180.32

Sun Hours(kWh/m2/day)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yr Avg or Total
South	3.4	3.7	3.5	3.1	2.6	2.5	2.6	2.9	3.3	3.7	3.3	3	3.13
days	31	28	31	30	31	30	31	31	30	31	30	31	365
kWh/mon	8182.97	8043.23	8423.65	7220.27	6257.57	5822.80	6257.57	6979.60	7686.09	8905.00	7686.09	7220.27	7390.43
East	3.4	3.7	3.5	3.1	2.6	2.5	2.6	2.9	3.3	3.7	3.3	3	3.13
days	31	28	31	30	31	30	31	31	30	31	30	31	365
kWh/mon	3628.46	3566.50	3735.18	3201.59	2774.71	2581.92	2774.71	3094.87	3408.14	3948.62	3408.14	3201.59	39371.46
West	3.4	3.7	3.5	3.1	2.6	2.5	2.6	2.9	3.3	3.7	3.3	3	3.13
days	31	28	31	30	31	30	31	31	30	31	30	31	365
kWh/mon	3628.46	3566.50	3735.18	3201.59	2774.71	2581.92	2774.71	3094.87	3408.14	3948.62	3408.14	3201.59	39371.46
North	0	0	0	0	2.6	2.5	2.6	2.9	0	0	0	0	0.88
days	31	28	31	30	31	30	31	31	30	31	30	31	365
kWh/mon	0.00	0.00	0.00	0.00	6257.57	5822.80	6257.57	6979.60	0.00	0.00	0.00	0.00	2109.79
Monthly kWh after Solar	660,378.45	595,240.36	659,924.34	640,394.32	657,753.80	637,208.31	657,753.80	655,669.43	639,515.39	659,016.11	639,515.39	662,194.91	7,789,882.14
Monthly Bill w/o solar	\$32,052.02	\$29,131.83	\$32,052.02	\$31,078.62	\$32,052.02	\$49,669.20	\$51,263.04	\$51,263.04	\$49,669.20	\$32,052.02	\$31,078.62	\$32,052.02	\$453,413.63
Bill/unit	\$120.50	\$109.52	\$120.50	\$116.84	\$120.50	\$186.73	\$192.72	\$192.72	\$186.73	\$120.50	\$116.84	\$120.50	\$142.05
Monthly Bill w/solar	\$31,362.63	\$28,454.21	\$31,342.35	\$30,470.33	\$31,245.44	\$48,440.26	\$49,942.34	\$49,789.95	\$48,608.93	\$31,301.80	\$30,431.09	\$31,443.73	\$442,833.06
Bill/unit	\$117.90	\$106.97	\$117.83	\$114.55	\$117.46	\$182.11	\$187.75	\$187.18	\$182.74	\$117.68	\$114.40	\$118.21	Total
Savings	\$689.39	\$677.62	\$709.67	\$608.29	\$806.58	\$1,228.94	\$1,320.70	\$1,473.09	\$1,060.27	\$750.22	\$647.53	\$608.29	\$10,580.58

Watts/SF	Size kW	Total kWh	Efficiency of Grid Connected System	kWh/Year	120/240 System Max Demand (kW)	Use Factor	120/240 Adjusted Demand (kW)	Daily kWh usage 120/240	Cost/kW Installed	Cost of System	Estimated simple payback using savings
5	89	88685.11	0.90	79,816.60	1513.93	0.6	908.36	21,800.59	\$8,500.00	\$757,286.69	
5	50	39324.42	0.90	35,391.97	1513.93	0.6	908.36	21,800.59	\$8,500.00	\$424,493.28	
5	50	39324.42	0.90	35,391.97	1513.93	0.6	908.36	21,800.59	\$8,500.00	\$424,493.28	
5	89	25317.53	0.90	22,785.78	1513.93	0.6	908.36	21,800.59	\$8,500.00	\$757,286.69	
									Total	\$2,363,559.93	223.39



Christopher R. Stultz | Construction Management
Dr. David Riley | Advisor

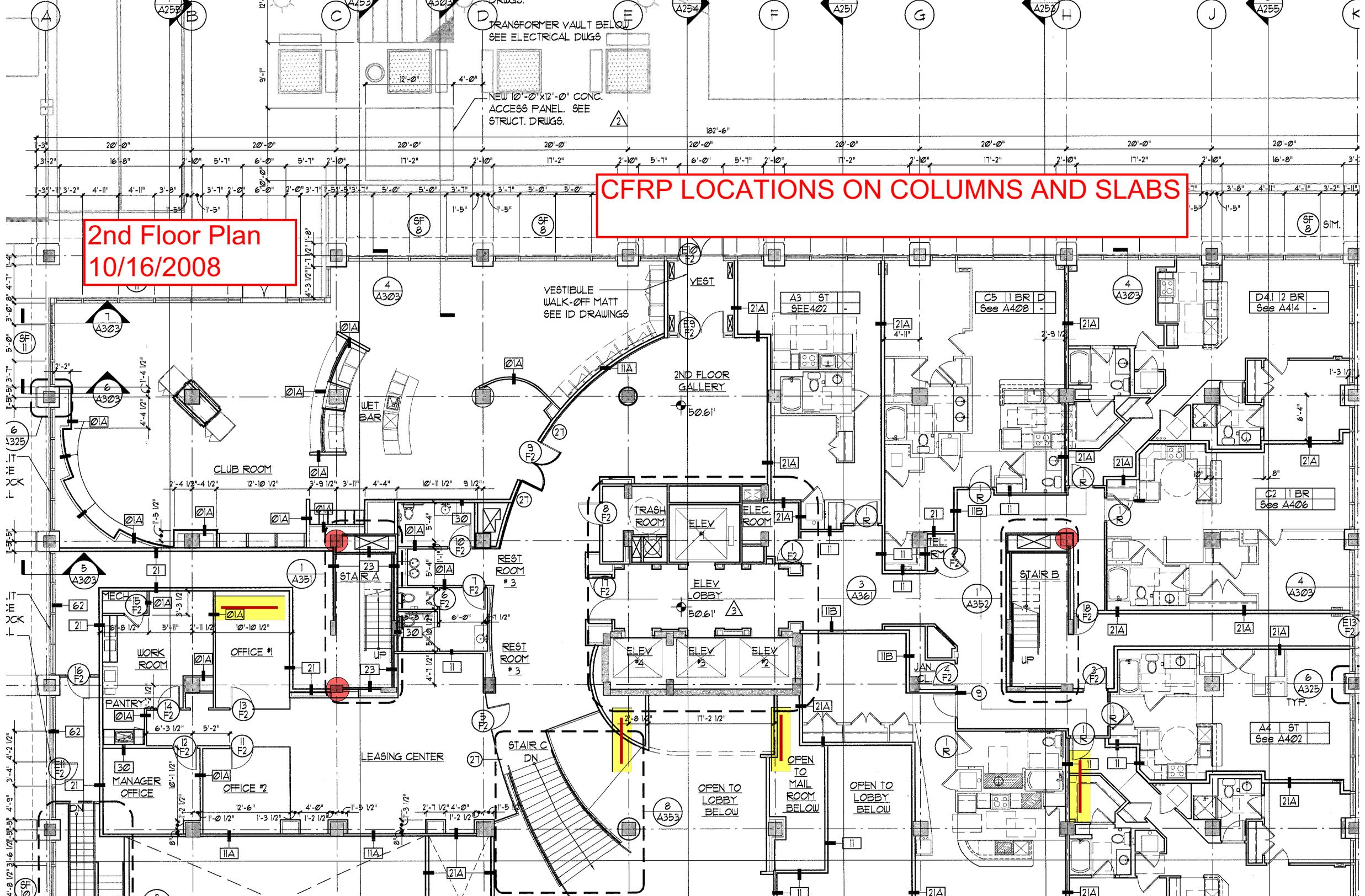
Appendix B Referenced Documents

CFRP LOCATIONS ON COLUMNS AND SLABS

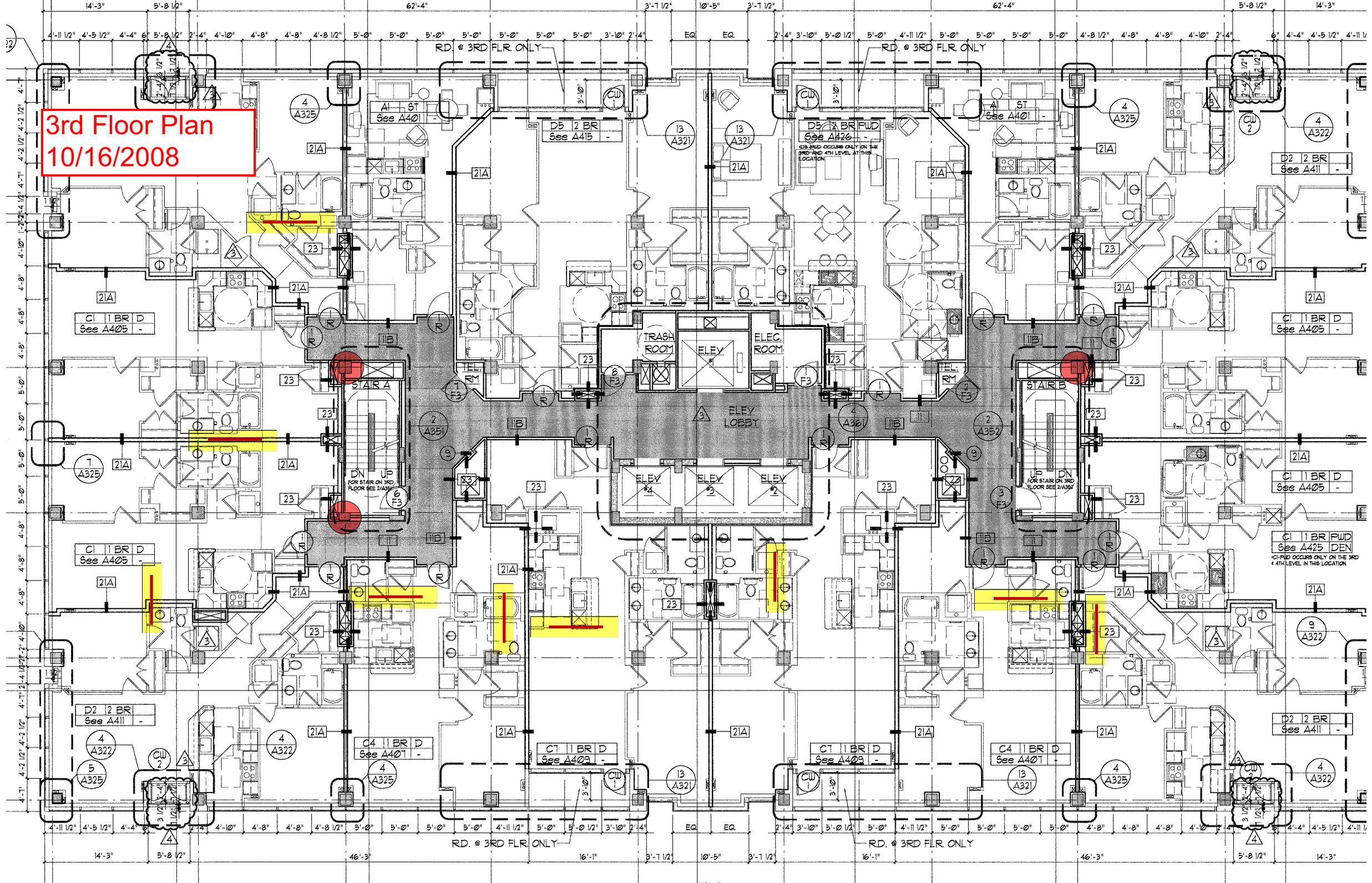
**2nd Floor Plan
10/16/2008**

TRANSFORMER VAULT BELOW
SEE ELECTRICAL DWGS

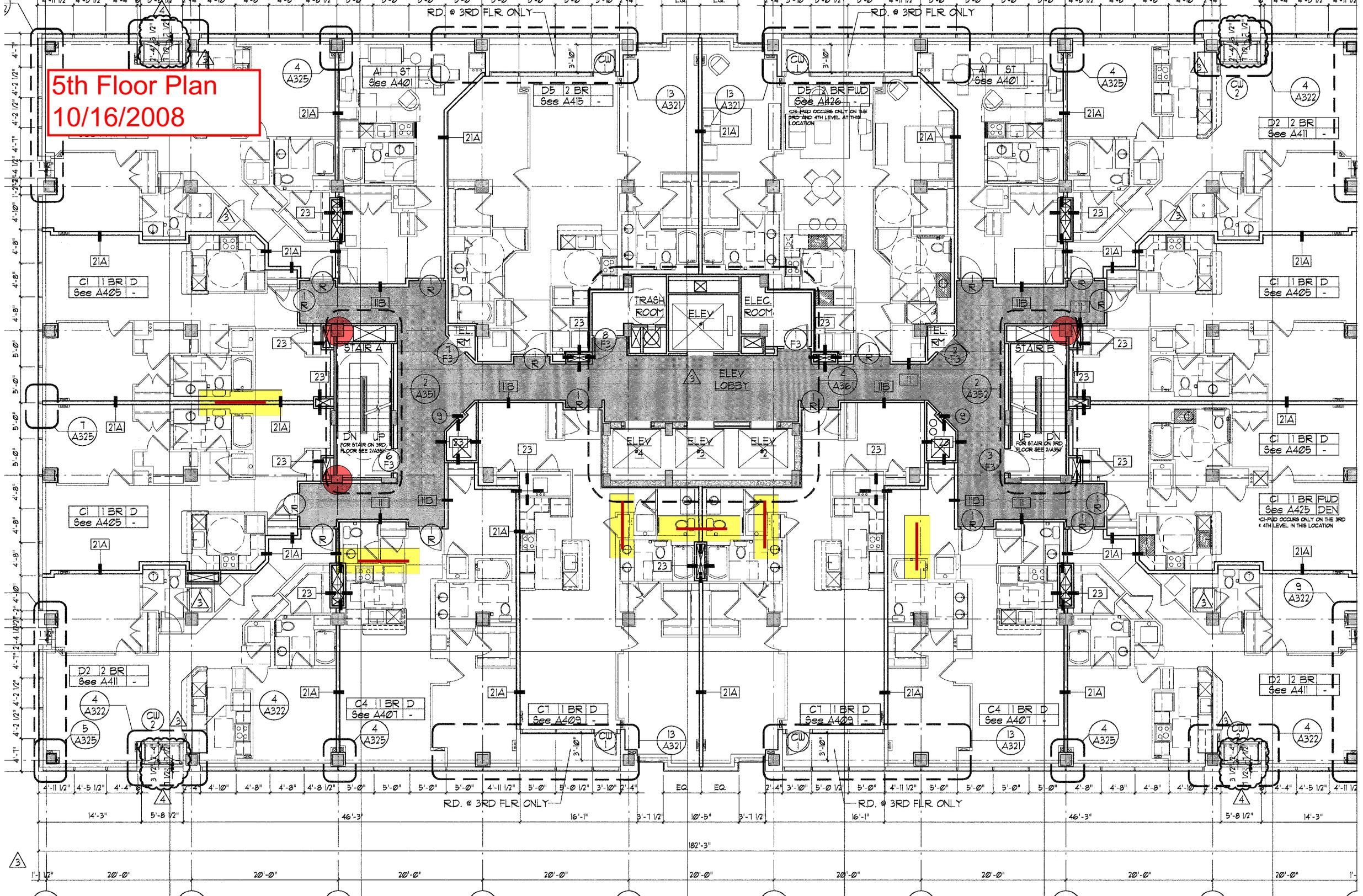
NEW 10'-0" X 12'-0" CONC.
ACCESS PANEL. SEE
STRUCT. DWGS.



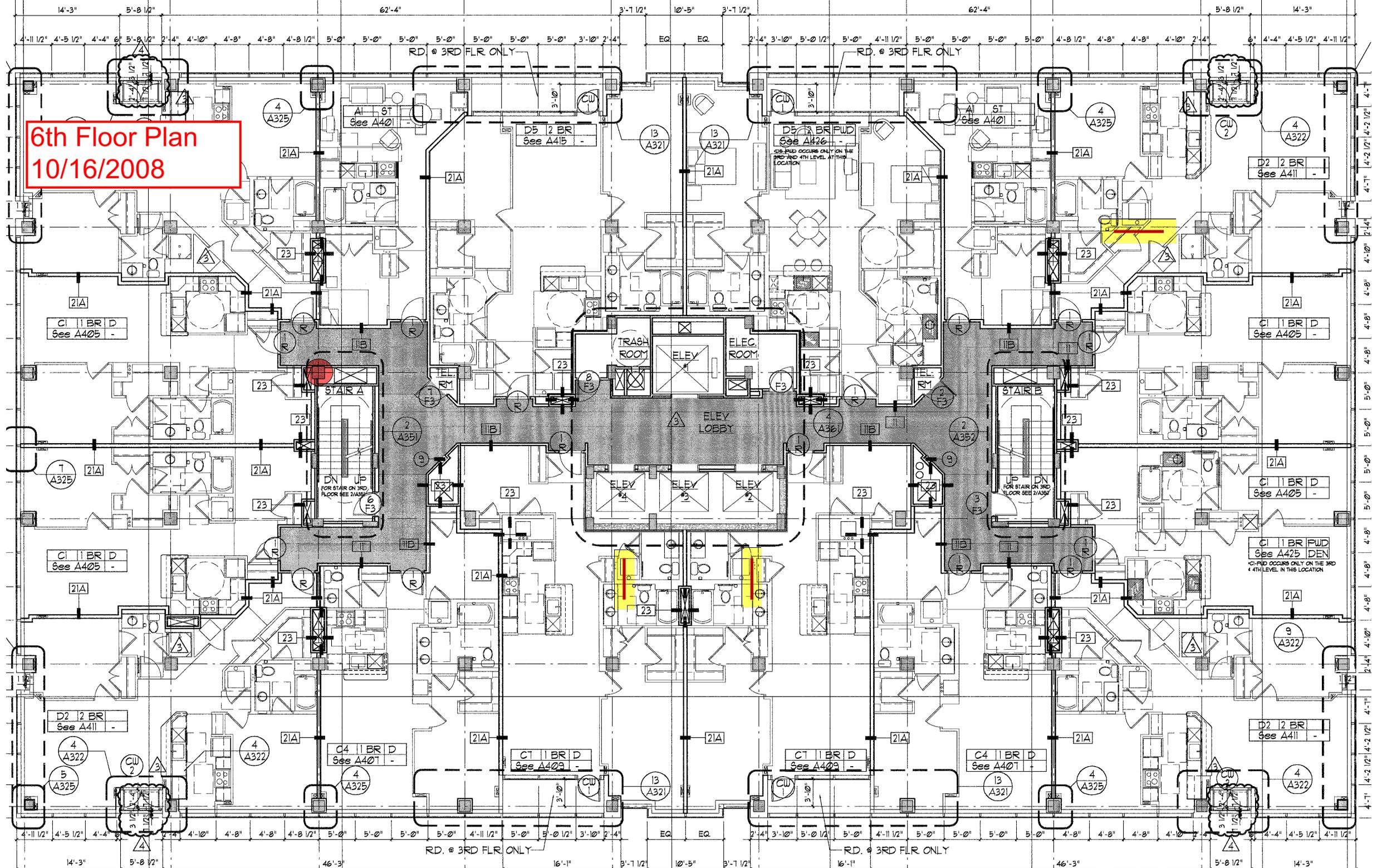
3rd Floor Plan
10/16/2008



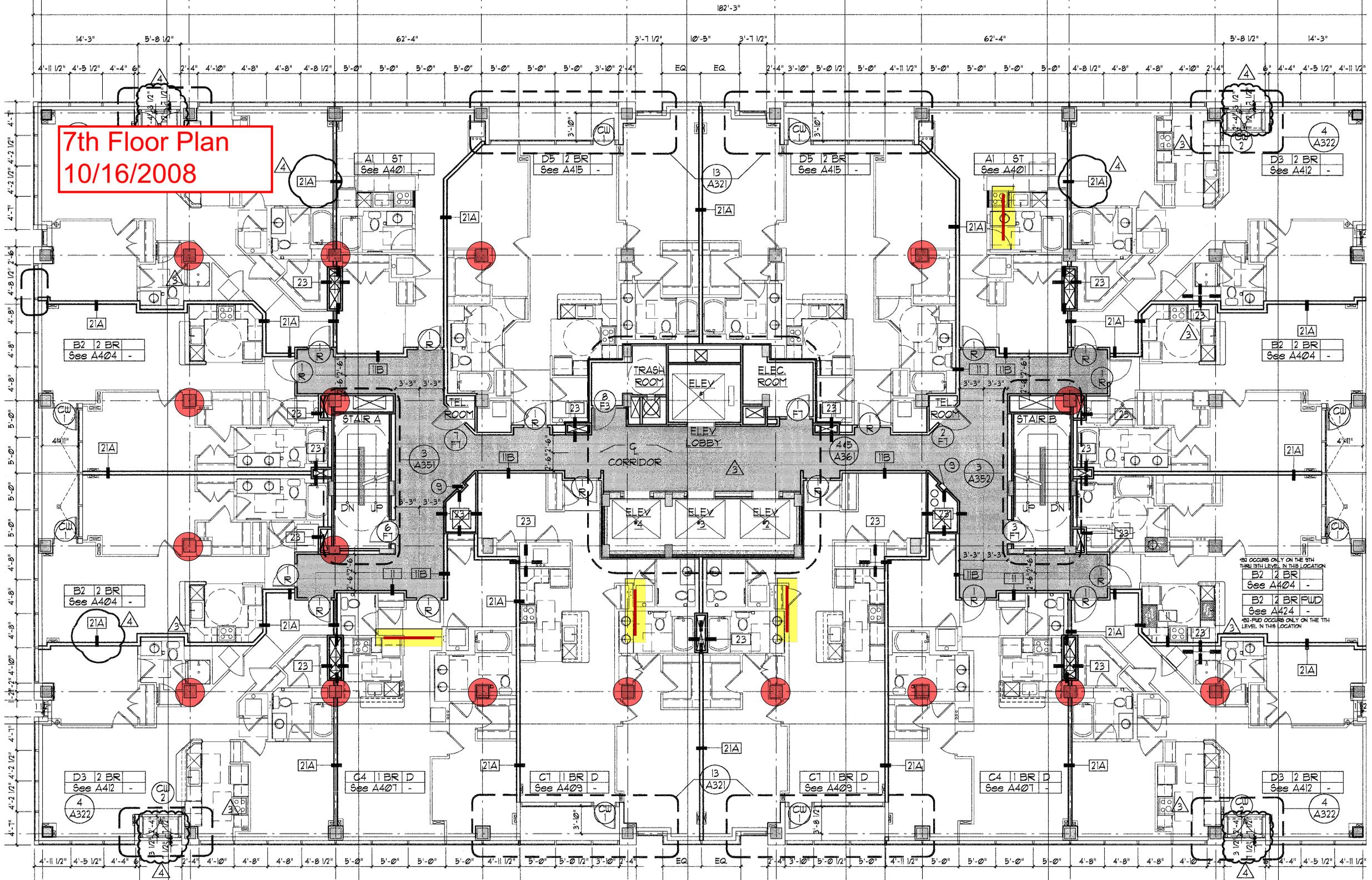
5th Floor Plan
10/16/2008



6th Floor Plan
10/16/2008

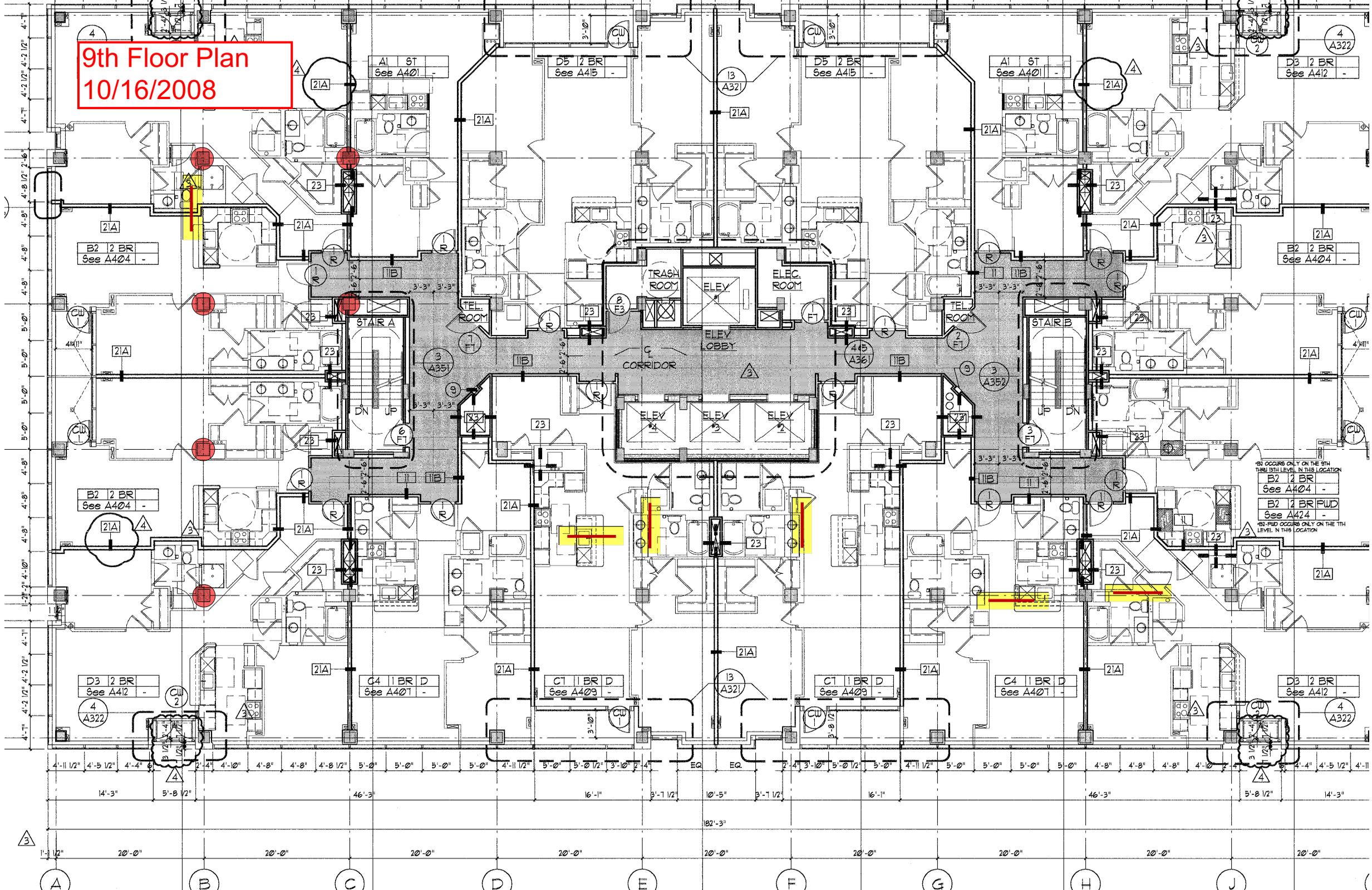


7th Floor Plan
10/16/2008



1B2 OCCURS ONLY ON THE 8TH
THRU 10TH LEVEL IN THIS LOCATION
B2 2 BR
See A404 -
B2 2 BR PUD
See A424 -
1B2 PUD OCCURS ONLY ON THE 11TH
LEVEL IN THIS LOCATION

9th Floor Plan
10/16/2008



BR OCCURS ONLY ON THE 9TH
THRU 10TH LEVEL. IN THIS LOCATION
B2 2 BR
See A404 -
B2 2 BR PWD
See A424 -
BR PWD OCCURS ONLY ON THE 10TH
LEVEL. IN THIS LOCATION

D3 2 BR
See A412 -
4
A322

C4 1 BR D
See A401 -

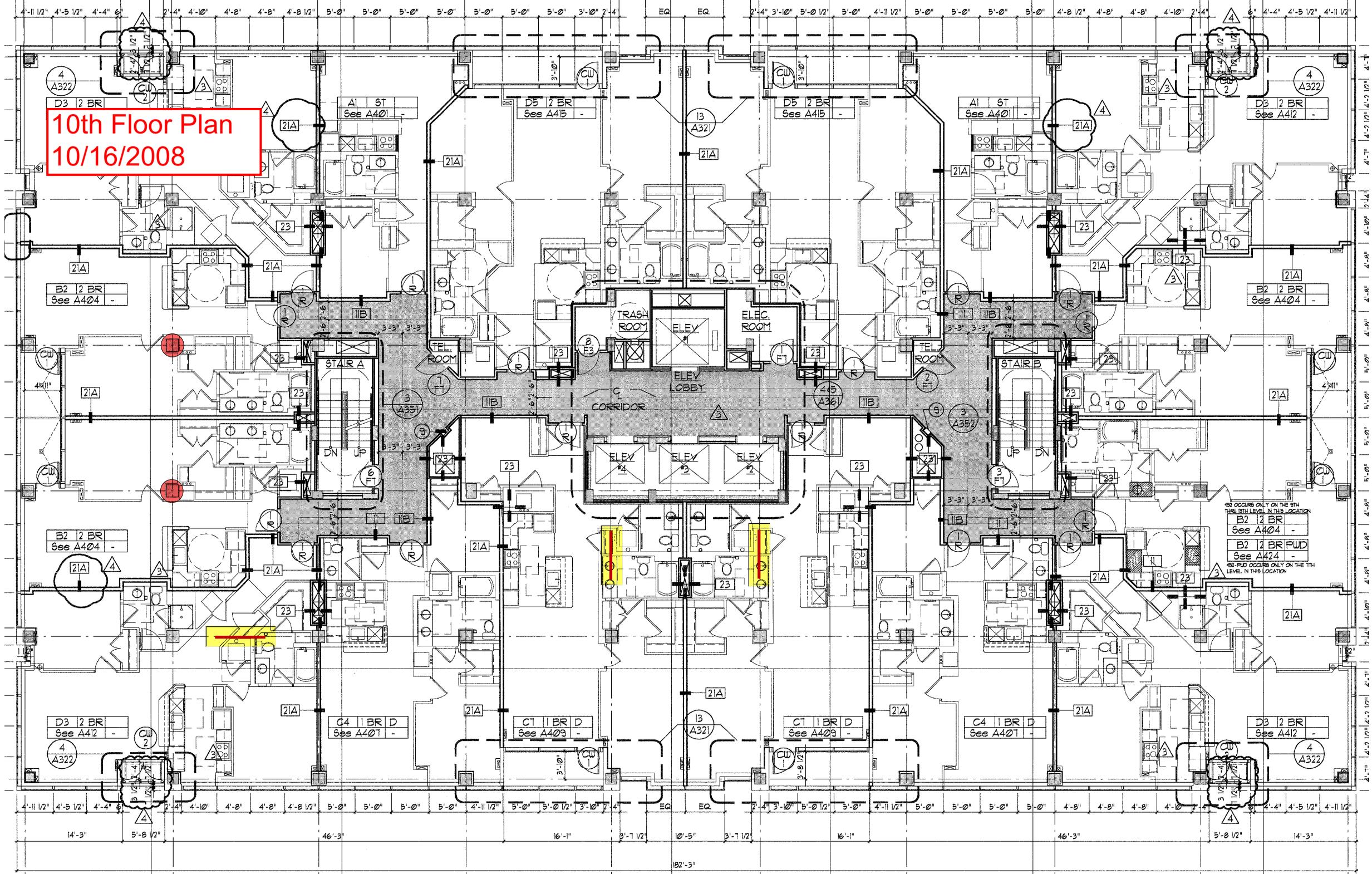
C7 1 BR D
See A403 -

C7 1 BR D
See A403 -

C4 1 BR D
See A401 -

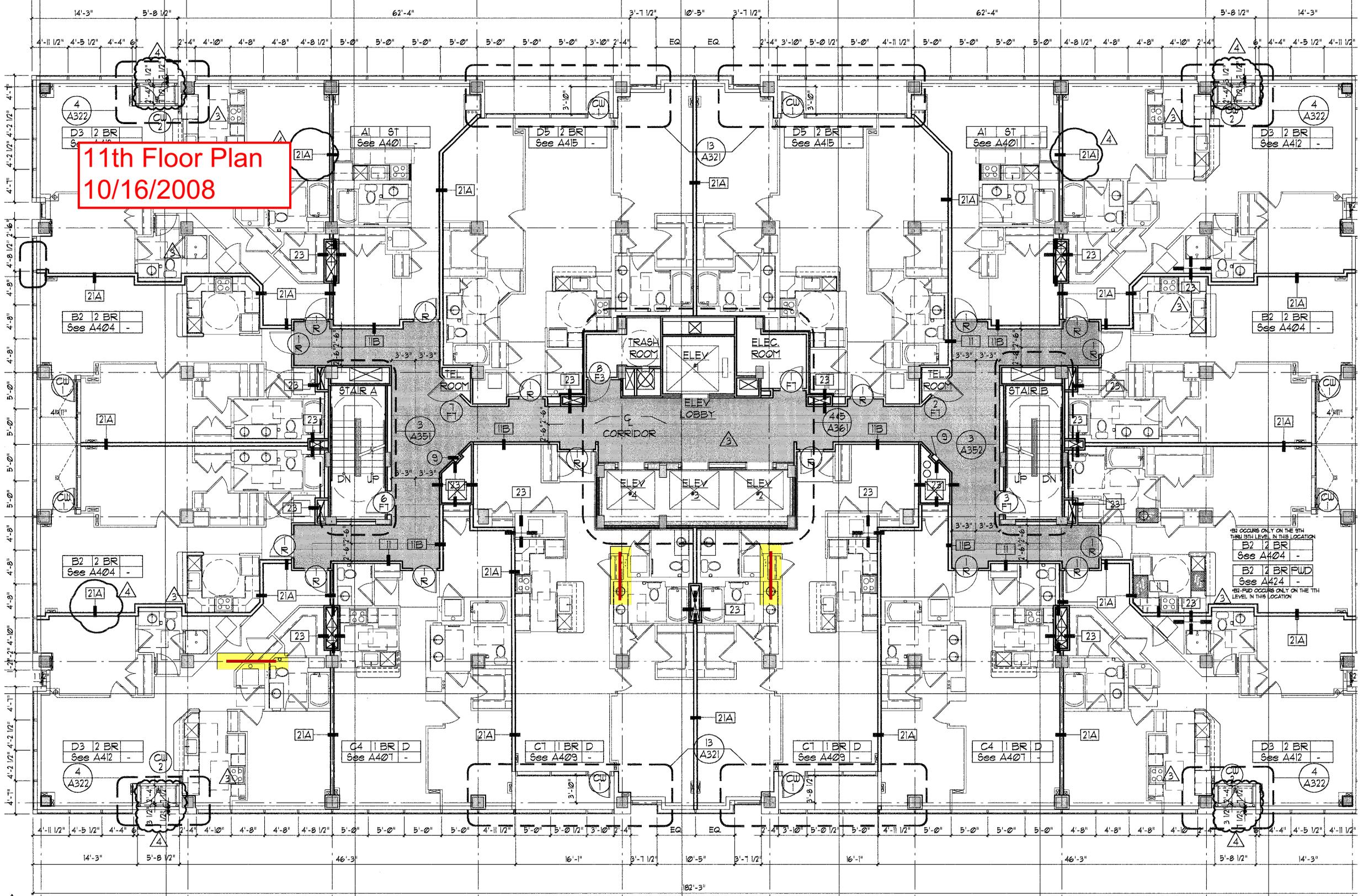
D3 2 BR
See A412 -
4
A322

10th Floor Plan
10/16/2008



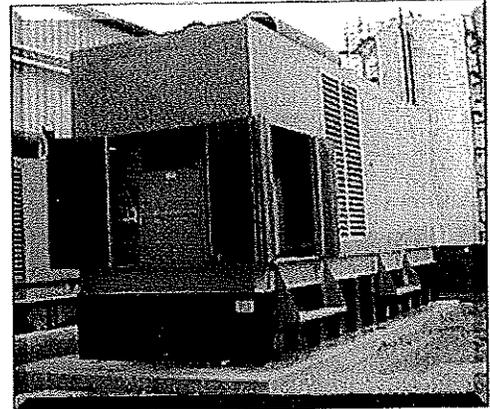
21A OCCURS ONLY ON THE 8TH
THRU 19TH LEVEL IN THIS LOCATION
B2 2 BR
See A404 -
B2 2 BR FWD
See A424 -
B2-FWD OCCURS ONLY ON THE 11TH
LEVEL IN THIS LOCATION

11th Floor Plan
10/16/2008

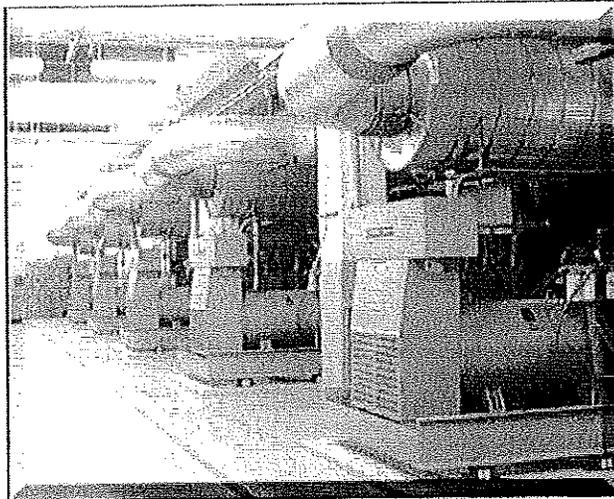


C Series

MTU Detroit Diesel Power Generation's Custom Product Series (C Series) engine generator sets are available in a multitude of configurations. We have the ability to custom build to the most demanding specifications in the market, minimizing the need for time consuming and costly modifications at the job site. The result is an engine generator set that arrives at the job site which has been factory engineered, built and tested. Our distributor network, consisting of factory certified technicians, ensures that the equipment is properly installed and implemented.



The C Series offers numerous options. From the brand of engine to the brand of battery charger, we can meet your preferences. We can provide a wide variety of options for control panels, load banks, voltage selector switches, water jacket heaters, silencers, mainline circuit breakers, paint colors, cooling systems, annunciation, fuel tanks, and many other options. No one in the industry can match MTU DD's ability to customize and engineer generator sets to a customer's specific requirements.



Fuel	kW Range	Frequency	Voltage
LP Gas	15 kW - 700 kW 12 kW - 580 kW	60 Hz 50 Hz	Single & Three Phase
Natural Gas	15 kW - 800 kW 12 kW - 650 kW	60 Hz 50 Hz	Single & Three Phase
Diesel	15 kW - 2800 kW 12 kW - 2480 kW	60 Hz 50 Hz	Single & Three Phase
Diesel, LP Gas, Natural Gas	15 kW - 200 kW	400 Hz	Three Phase
Diesel	300 kW - 2800 kW 250 kW - 2480 kW	60 Hz 50 Hz	Medium Voltage



C Series

Standard Features

Engine Features:

- Radiator cooled
- Starter and alternator
- Oil pump and filter
- Air cleaner
- Mechanical governor 3-5%
 - standard up to 230 kW diesel
- Isochronous governor
 - 250 kW diesel and higher
 - standard on all gaseous models

Control Panel Features:

- 45 Series panel
 - 4 LEDs
 - 5 engine shutdowns: OS, OC, LOP, HWT, LCL
- Gauges
 - oil pressure, battery charging voltmeter, running time meter and engine temperature
- Meters—2% accuracy
 - voltmeter
 - ammeter
 - frequency meter
 - three position engine control switch
- Generator features
 - brushless single bearing, direct coupled
 - automatic voltage regulator
 - over-excitation protection
 - under-frequency compensation protection
- Additional standard features
 - oil drain extension
 - fuel flex
 - exhaust flex
 - battery cables
 - vibration pads

Optional Features:

- Cooling systems—high ambient temperature options
 - remote (vertical or horizontal) radiators
 - heat exchangers
- Isochronous governors—load sharing and paralleling controls
- Control panels
 - 50 Series—12 LED NFPA 110 panel
 - DGC 500—digital NFPA 110 panel
 - DGC 2001—digital, remote communication capable
 - DGC 2000—digital, additional monitoring and remote communications
 - custom control panel
- Generators
 - Note: Marathon standard but we do offer choice of Kato, Leroy Somers, Newage, and others
 - PMG
- Mainline circuit breakers
 - Note: Our standard MLCB is GE, 80% rated, thermo magnetic type trip (up to 1200 amps). Above 1200 amps electronic, 100% rated insulated case type breakers are standard.
 - Siemens, Cutler-Hammer, and Square D are available
 - 100% rated breaker
 - fusible disconnects
- Silencers—industrial, residential, critical, hospital grade available
- Battery chargers—ferro-resonant, solid state, dual rated, or preferred manufacturer
- Batteries, lead acid or NiCd



DETROIT DIESEL

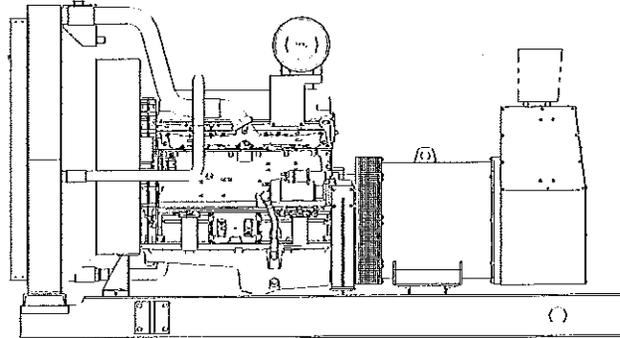




DETROIT DIESEL



450 ekW 60 Hz Standby
415 ekW 60 Hz Prime
208 - 4160V



- EPA Tier 3 Certified
- Generator Set Tested to ISO 8528-5 for Transient Response
- UL2200, CSA Listing Offered
- Accepts Rated Load in One Step Per NFPA 110, Level 1
- All MTU DD is a single source supplier
- Global Product Support
- 2 Year Standard Warranty
- Complete Range of Accessories
- Custom Design for any Application

Series 60 (6063HV35) Diesel Engine

- 14.0 Liter Displacement
- Electronic Unit Pump Injection
- 4-Cycle

Permanent Magnet Generator (PMG)

- Brushless, Rotating Field
- 300% Short Circuit Capability
- 2/3 Pitch Windings

Digital Control Panel

- UL 508 Listed, CSA Certified, NFPA 110
- Complete System Metering
- LCD Display

Cooling System

- Integral Set-mounted
- Engine Driven Fan

GEN-SET RATINGS

Standby - 130^o Rise

Voltage (L-L)	Phase	PF	Hz	kW	kVA	AMPS	skVA @ 30% voltage dip	Generator Model*	Connection
240v	1	1.0	60	450	450	1875	770	574RSL4037	12 LEAD ZIG-ZAG
208v	3	0.8	60	450	562.5	1561	1300	572RSL4027	12 LEAD LOW WYE
240v	3	0.8	60	450	562.5	1353	1300	572RSL4027	12 LEAD HI DELTA
480v	3	0.8	60	450	562.5	677	1100	572RSL4025	12 LEAD HI WYE
600v	3	0.8	60	450	562.5	541	1040	572RSS4270	4 LEAD WYE
4160v	3	0.8	60	450	562.5	78	1240	573FSM4354	6 LEAD WYE

Prime - 105^o Rise

Voltage (L-L)	Phase	PF	Hz	kW	kVA	AMPS	skVA @ 30% voltage dip	Generator Model*	Connection
240v	1	1.0	60	415	415	1729	770	574RSL4037	12 LEAD ZIG-ZAG
208v	3	0.8	60	415	518.75	1440	1300	572RSL4027	12 LEAD LOW WYE
240v	3	0.8	60	415	518.75	1248	1300	572RSL4027	12 LEAD HI DELTA
480v	3	0.8	60	415	518.75	624	1100	572RSL4025	12 LEAD HI WYE
600v	3	0.8	60	415	518.75	499	1040	572RSS4270	4 LEAD WYE
4160	3	0.8	60	415	518.75	72	1240	573FSM4354	6 LEAD WYE

The Generator Model Number identified in the table is for standard C Series Configuration. Consult the factory for alternate configuration



STANDARD EQUIPMENT

ENGINE

- Air Cleaners
- Oil Pump
- Full Flow Oil Filter
- Jacket Water Pump
- Thermostat
- Exhaust Manifold – dry
- Blower Fan & Fan Drive
- Radiator - Unit Mounted
- Electric Starting Motor - 24V
- Governor – Electric Isochronous
- Base - Structural Steel
- SAE Flywheel & Bell Housing
- Charging Alternator - 24V
- Battery Box & Cables
- Flexible Fuel Connectors
- Flexible Exhaust Connection
- EPA Certified Engine

DIGITAL CONTROL PANEL

- Digital Metering
- Engine Parameters
- Generator Protection Functions
- Engine Protection
- SAE J1939 Engine ECU Communications
- Windows-based Software
- Multilingual Capability
- Remote Communications to our RDP-110 Remote Annunciator
- 16 Programmable Contact Inputs
- 7 contact outputs
- UL Recognized, CSA certified, CE approved
- Event Recording
- IP 54 Front Panel Rating with Integrated Gasket
- NFPA110 Level Compatible

GENERATOR

- NEMA MG1, IEEE and ANSI standards compliance for temperature rise and motor starting
- Sustained short circuit current of up to 300% of the rated current for up to 10 seconds
- Self Ventilated and Drip-proof
- Superior Voltage Waveform
- Digital, Solid State, Volts-per-hertz Regulator
- No Load to Full Load Regulation
- Brushless Alternator with Brushless Pilot Exciter
- 4 pole, Rotating Field
- 130°C Standby Temperature Rise
- 1 Bearing, Sealed
- Flexible Coupling
- Full Amortisseur Windings
- 125% Rotor Balancing
- 3-phase Voltage Sensing
- $\pm .25\%$ Voltage Regulation
- 100% of Rated Load - One Step
- 3% Maximum Harmonic Content



APPLICATION DATA

Engine

Manufacturer:	MTU Detroit Diesel	Rated RPM:.....	1800
Model:	Series 60 (6063HV35)	Engine Governor:.....	DDEC
Type:.....	4-Cycle	Max Power: Standby: bhp (kWm)	685 (511)
Arrangement:	6-Inline	Prime: bhp (kWm)	623 (465)
Displacement: in. ³ (lit)	855 (14.0)	Speed Regulation:	±.25%
Bore: in. (cm)	5.24 (13.3)	Frequency:	60 Hz
Stroke: in. (cm)	6.61 (16.8)	Air Cleaner:.....	Dry
Compression Ratio:.....	16.0:1		

Liquid Capacity (Lubrication)

Total oil system: gal (lit)	9.5 (36)
Engine Jacket water capacity: gal (lit)	6.0 (23)
System Coolant capacity: gal (lit)	42 (159)

Electrical

Electric volts DC:	24
Cold cranking Amps under 0°F (-17.8°C):.....	1250

Fuel System

Fuel Supply Connection Size:.....	½" NPT
Fuel Return Connection Size:	½" NPT
Maximum Fuel Lift: ft (m)	6.8 (2.1)
Recommended Fuel:	Diesel #2
Total Fuel Flow: gal/hr (lit/hr)	90.8 (344)

Fuel Consumption

	Standby	Prime
100% Power Rating: gal/hr (lit/hr).....	34.6 (131) ..	32.3 (122)
75% Power Rating: gal/hr (lit/hr).....	26.4 (100) ..	24.3 (92)
50% Power Rating: gal/hr (lit/hr).....	18.2 (69) ..	16.4 (62)

Cooling - Radiator System

	Standby	Prime
Ambient Capacity of Radiator: °F (°C).....	122 (50).....	122 (50)
Maximum Allowable Static Pressure on Radiator Exhaust: in. H ₂ O (kPa)	0.5 (0.12)	0.5 (0.12)
Water Pump Capacity: gal/min (lit/min)	96 (363)	96 (363)
Heat Rejection to Coolant: BTUM (kW).....	9,400 (165)	9,300 (163)
Heat Rejection to Air to Air: BTUM (kW).....	7,250 (127)	5,950 (105)
Heat Radiated to Ambient: BTUM (kW)	6,505 (114)	6,417 (113)

Air Requirements

	Standby	Prime
Aspirating: CFM (m ³ min)	1,395 (39.5)	1,345 (38.1)
Air Flow Required for Radiator Cooled Unit: CFM (m ³ min)	26,991 (764).....	26,991 (764)
Air Flow Required for Heat Exchanger/ Remote Radiator based on 25°F Rise: CFM (m ³ min).....	18,070 (512).....	17,825 (505)

Exhaust System

	Standby	Prime
Gas Temp.(Stack): °F (°C).....	1,058 (570).....	980 (527)
Gas Volume at Stack Temp: CFM (m ³ min).....	3,973 (112.5) ..	3,630 (102.8)
Maximum Allowable Back Pressure: in. H ₂ O (kPa)	40.8 (10.2)	40.8 (10.2)



450 kW Diesel Gen-Set

EMISSIONS DATA

NO _x + NMHC	CO	PM
2.80	0.80	0.13

All units are in g/hp-hr and are EPA D2 cycle values.

Emission levels of the engine may vary as a function of ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data provided are laboratory results from one engine representing this rating. The data was obtained under controlled environmental conditions with calibrated instrumentation traceable to the United States National Bureau of Standards and in compliance with US EPA regulations found within 40 CFR Part 89. The weighted cycle value from each engine is guaranteed to be below the US EPA Standards at the US EPA defined conditions.

SOUND DATA

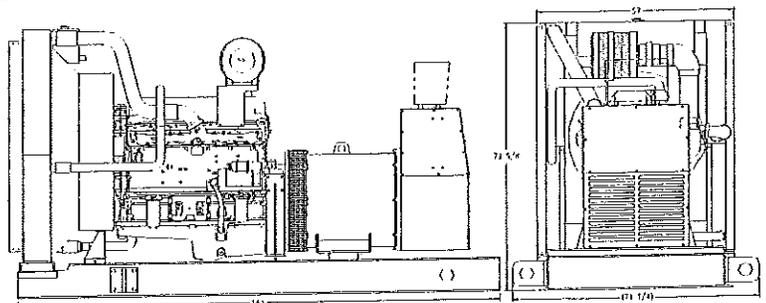
	Standby	Full Load	Standby No Load	Prime Full Load	Prime No Load
23 ft (7m) OPU w/ critical grade muffler (dBA)	97.5	89	96	89	81
23 ft (7m) Sound Attenuated Enclosure (dBA)	89.5	81	88	81	81

RATING DEFINITIONS and CONDITIONS

- Ambient capability factor at 300m (984 ft). Consult your local MTU DD Power Generation Distributor for other altitudes.
- Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271.
- Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO-8528/1, overload power in accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271. For limited running time and base load ratings, consult the factory.
- Deration Factors:
 - Altitude: Derate 1% per 1,000 ft (305 m) above 600 ft (183m).
 - Temperature: Derate 1% per 10°F (5.5°C) above 77°F (25°C).

Weights & Dimensions

Length: in. (cm)	140 (355.6)
Width: in. (cm)	57 (144.8)
Height: in. (cm)	79.6 (202.2)
Weight (dry) lb. (kg):	6,726 (3,051)



Drawing above for illustration purposes only, based on standard open power 480 volt generator. Lengths may vary with other voltages.
*Do Not Use for Installation Design

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Schedule GS-4
LARGE GENERAL SERVICE
PRIMARY VOLTAGE

I. APPLICABILITY

Except as modified herein, this schedule is applicable only to a non-residential transmission or primary voltage Customer (as defined in Paragraph XI.) who elects to receive Electricity Supply Service and Electric Delivery Service from the Company and whose peak measured demand has reached or exceeded 500 kW during at least three billing months within the current and previous 11 billing months.

For a Customer served under this schedule whose peak measured demand has decreased to less than 500 kW, this schedule shall remain applicable to the Customer and the Customer shall not have the option to purchase electricity under Schedule GS-1, GS-2, or GS-2T until such time as the maximum measured demand has remained at less than 500 kW during all billing months within the current and previous 11 billing months.

At such time the Customer no longer meets the above applicability requirements, the Customer shall remain on this schedule for the period (not exceeding two additional billing months) required to achieve an orderly transfer to the applicable schedule.

For new service, this schedule is applicable when the anticipated kW demand meets the above criteria.

II. 30-DAY RATE

A. Distribution Service Charges

1. Basic Customer Charge
Basic Customer Charge \$127.60 per billing month.

2. Plus Distribution Demand Charge

First 5000 kW of Distribution Demand	@	\$1.000 per kW
Additional kW of Distribution Demand	@	\$0.755 per kW

3. Plus rkVA Demand Charge @ \$0.15 per rkVA

(Continued)

Schedule GS-4
LARGE GENERAL SERVICE
PRIMARY VOLTAGE

II. 30-DAY RATE (Continued)

B. Electricity Supply Service Charges

1. On-Peak Electricity Supply Demand Charge

a. All On-Peak Electricity Supply Demand for
Primary Service Voltage @ \$ 12.003 per kW

b. All On-Peak Electricity Supply Demand for
Transmission Service Voltage @ \$ 11.715 per kW

2. Plus Off-Peak Electricity Supply Demand Charge
All Off-Peak kW Demand @ \$ 0.632 per kW

3. Plus Electricity Supply Adjustment Demand Charge
First 5000 kW of Demand @ (\$ 0.421) per kW
Additional kW of Demand @ (\$ 0.318) per kW

4. Plus Electricity Supply kWh Charge
All On-peak kWh @ 0.404¢ per kWh
All Off-Peak kWh @ 0.272¢ per kWh

5. Each Electricity Supply kilowatthour used is subject to all applicable riders.

6. Each On-Peak Electricity Demand billed pursuant to Paragraph II.B.1 above,
is subject to all applicable riders.

C. The minimum charge shall be as may be contracted for.

(Continued)

Schedule GS-4
LARGE GENERAL SERVICE
PRIMARY VOLTAGE

III. DETERMINATION OF ON-PEAK AND OFF-PEAK HOURS

The following on-peak and off-peak hours are applicable to the billing of all charges stated in this schedule.

A. On-peak hours are as follows:

1. For the period of June 1 through September 30, 10 a.m. to 10 p.m., Mondays through Fridays.
2. For the period of October 1 through May 31, 7 a.m. to 10 p.m., Mondays through Fridays.

B. All hours not specified in III.A. are off-peak.

IV. DETERMINATION OF DISTRIBUTION DEMAND

A. Distribution Demand shall be billed only where the normal service delivery voltage is less than 69 kV.

B. The Distribution Demand billed under Paragraph II.A.2. shall be such as may be contracted for but not less than the highest of:

1. The highest average kW measured at the location during any 30-minute interval of the current and previous 11 billing months.
2. 500 kW.

C. When the Customer's power factor is less than 85 percent, a minimum distribution demand of not less than 85 percent of the Customer's maximum kVA demand may be established.

V. DETERMINATION OF rkVA DEMAND

The rkVA of demand billed shall be the highest average rkVA measured in any 30-minute interval during the current billing month.

(Continued)

Schedule GS-4
LARGE GENERAL SERVICE
PRIMARY VOLTAGE

VI. DETERMINATION OF ON-PEAK ELECTRICITY SUPPLY DEMAND

The kW of demand billed under II.B.1. shall be the highest of:

- A. The highest average kW measured in any 30-minute interval of the current billing month during on-peak hours.
- B. Seventy-five percent of the highest kW of demand at this location as determined under VI.A., above, during the billing months of June through September of the preceding 11 billing months.
- C. 100 kW.

VII. DETERMINATION OF OFF-PEAK ELECTRICITY SUPPLY DEMAND

The kW of demand billed under Paragraph II.B.2. shall be the off-peak demand which is in excess of 90% of the On-Peak Electricity Supply Demand determined under Paragraph VI.

VIII. DETERMINATION OF ELECTRICITY SUPPLY ADJUSTMENT DEMAND

This credit is required in order to achieve customer bill neutrality, arising from changes to the Distribution Demand Charge while maintaining the overall capped rates. The kW of demand billed under Paragraph II.B.3. shall be the Distribution Demand determined under Paragraph IV.

IX. METER READING AND BILLING

When the actual number of days between meter readings is more or less than 30 days, the Basic Customer Charge, the Distribution Demand Charge, the rkVA Demand Charge, the On-Peak Electricity Supply Demand Charge, the Off-peak Electricity Supply Demand Charge, the Electricity Supply Adjustment Demand Charge, and the minimum charge of the 30-day rate will each be multiplied by the actual number of days in the billing period and divided by 30.

(Continued)

Schedule GS-4
LARGE GENERAL SERVICE
PRIMARY VOLTAGE

X. STANDBY, MAINTENANCE OR PARALLEL OPERATION SERVICE

A Customer requiring standby, maintenance or parallel operation service may elect service under this schedule provided the Customer contracts for the maximum kW which the Company is to supply. Standby, maintenance or parallel operation service is subject to the following provisions:

- A. Suitable relays and protective apparatus shall be furnished, installed, and maintained at the Customer's expense in accordance with specifications furnished by the Company. The relays and protective equipment shall be subject, at all reasonable times, to inspection by the Company's authorized representative.
- B. In case the Distribution Demand determined under Paragraph IV. exceeds the contract demand, the contract demand shall be increased by such excess demand.
- C. The demand billed under II.A.2. and II.B.3. shall be the contract demand.

XI. DEFINITION OF TRANSMISSION, PRIMARY AND SECONDARY VOLTAGE CUSTOMER

- A. A transmission voltage Customer is any Customer whose delivery voltage is 69 kV or above.
- B. A primary voltage Customer is any Customer (a) served from a circuit of 69 kV or more where the delivery voltage is 4,000 volts or more, (b) served from a circuit of less than 69 kV where Company-owned transformation is not required at the Customer's site, (c) where Company-owned transformation has become necessary at the Customer's site because the Company has changed the voltage of the circuit from that originally supplied, or (d) at a location served prior to October 27, 1992 where the Customer's connection to the Company's facilities is made at 2,000 volts or more.
- C. A secondary voltage Customer is any Customer not defined in XI.A. or XI.B. as a transmission or primary voltage Customer.

(Continued)

Schedule GS-4
LARGE GENERAL SERVICE
PRIMARY VOLTAGE

(Continued)

XII. TERM OF CONTRACT

The contract shall be open order unless (a) standby, maintenance or parallel operation service is provided, or (b) the Customer or the Company requests a written contract. In such cases, the term of contract for the purchase of electricity under this schedule shall be as mutually agreed upon, but for not less than one year. During the minimum term of applicability, the Customer may be billed under the corresponding Unbundled Rate Schedule GS-4U, if applicable.